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Calf Note #248 – IgY for challenged calves

Introduction

In a recent article in Progressive Dairyman magazine, Dr. Drew Vermeire wrote about his first-hand experience using chicken egg antibodies to prevent / treat calf disease. Dr. Drew owns a contract research facility in northwest Pennsylvania (for more information on Dr. Drew's company, Nouriche Nutrition Ltd., check out his website) and was conducting research with alternatives to antibiotics and find methods to prevent young animal morbidity. Calves in the study (n = 160) were fed either 0, 10, or 20 grams of a product containing whole egg powder from days 1 to 14, then 0, 5, or 10 g/d until day 28.

The whole egg powder was specifically obtained from hyperimmunized birds. That is, chickens are vaccinated against one or more pathogens important to a disease-causing agent, often in another species. For example, the birds might be vaccinated against bovine rotavirus. After a period of time, the eggs produced by the birds will contain antibodies specifically against the vaccine agent (e.g., rotavirus). The eggs can be processed (collected, mixed, pasteurized, spray-dried, and tested for efficacy) and then sold as a preventative or treatment for the specific disease. Often, eggs from birds with different "specificities" are blended to make powder that is effective against multiple pathogens.

Does it work? In a word, yes… BUT it depends on the specificity of the diseases on the farm. For example, if you're using egg powder with antibodies against rotavirus, but calves are developing cryptosporidiosis, then, NO, it won't work. However, if rotavirus is your problem, you can expect quick and dramatic results. In Dr. Drew's case, calves were very stressed due to a delay in transit and many hours on a truck during transport to the experimental farm and the research protocol prohibited the use of antibiotics. Thus, mortality in the control calves was abnormally high – nearly 17%. However, increasing dose of IgY resulted in a linear decline in mortality (Figure 1) to normal levels of mortality for the farm.

Magic? No. The biology of immunoglobulins in the intestine has been known for a long time and the use of chicken IgY (IgY is the chicken form of IgG) to prevent or treat diseases in other species (including man) has been studied since the 1980's (e.g., Bartz et al., 1980; Ikemori et al., 1992, 1997; Kuroki et al., 1997). The idea is simple – feed IgG (or IgY) during periods of exposure to a potential pathogen. Immunoglobulin molecules are relatively resistant to digestion, so they retain much of their immune activity even in the intestine. Indeed, numerous studies have reported that oral Ig can be recovered in the feces of animals and these Ig retain immune activity. The IgG (or IgY) interact with the antigenic binding sites on the pathogen and interfere with binding, thereby blocking the infection), or signal the calf's cellular immune response to kill the pathogen, or both. The end result is the same – a significant protective effect of the immunoglobulins on intestinal health.

Results in the study conducted by Dr. Drew are consistent with published research as well as on-farm observations that – when properly applied – whole egg powder containing hyperimmunized chicken egg antibody can be an effective means to prevent and/or treat many intestinal pathogens.

References

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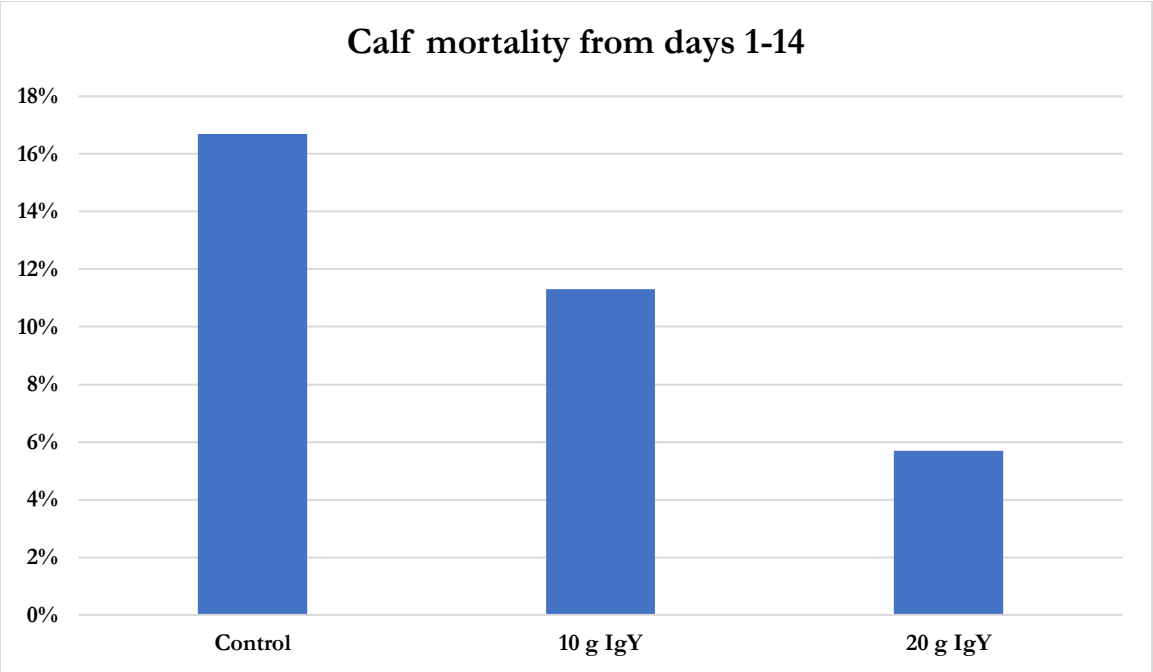

Figure 1. Mortality in calves fed graded levels of whole egg powder containing IgY. From Progressive Dairyman, March 29, 2024.

Written by Dr. Jim Quigley (31 May 2024)

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